Extron Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

SYSTEM 4LQ*xi* – LINE QUADRUPLER WITH BUILT-IN SWITCHER

Universal projector control

Video or S-Video line quadrupler

Quad Standard decoder (NTSC 3.58, NTSC 4.43, PAL & SECAM)

Three line adaptive comb filter

Motion mode compensation

RGsB, RGBS or RGBHV outputs

RS-232 control

Sync polarity programming

Triple Action Switching™

300 MHz (-3 dB) video bandwidth

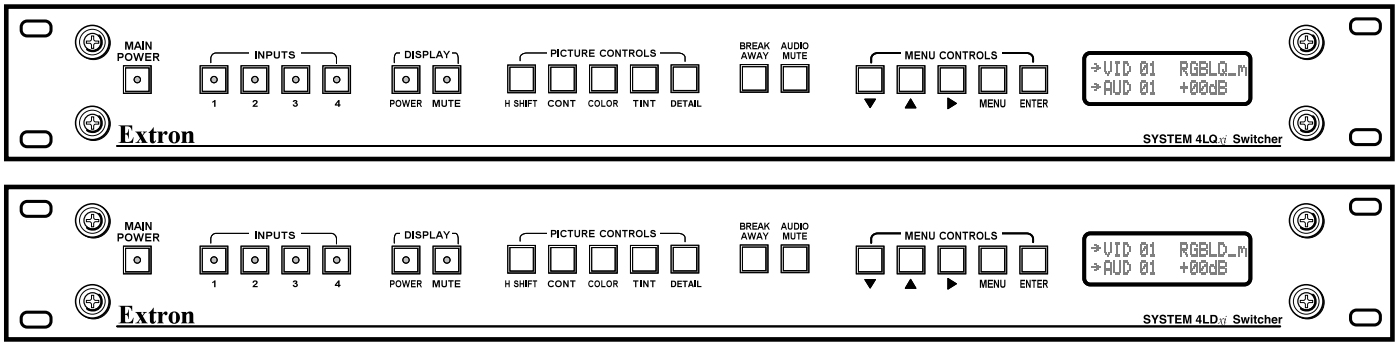
Balanced/unbalanced stereo audio inputs

Rack mountable

SERVICE 3 SUPPORT SOLUTIONS

APPLICATIONS

APPLICATIONS (Cont.)



Extron's System 4LQ*xi* is a line quadrupler with a built-in, four-input switcher. It provides universal projector control and is compatible with most digitally controlled data grade projectors on the market today. The System 4LQ*xi* is also quad-standard compatible with NTSC 3.58, NTSC 4.43, PAL and SECAM for use with all international video formats.

Line quadrupling is similar to line doubling except that the number of horizontal scan lines are increased by a factor of four instead of two. Increasing the horizontal scan rate by a factor of four (to 63 kHz), allows most CRT's to obtain a range of optimum efficiency, maximizing light output with projector light output up to 60% brighter than NTSC, PAL, or SECAM displays. In addition to increased picture brightness, the image becomes smoother and has a "film-like" quality.

Extron's System 4LQ*xi* has a high quality three-line adaptive comb filter which provides a crisp, stable image. In addition, an internal TBC (Time Base Corrector) actually cleans-up low quality videotape signals (common to VHS tape players) for a more stable and sharper image. The System 4LQ*xi* also provides motion mode compensation to remove the motion "jaggies" typically found in line doubled and line quadrupled video.

In a large-screen venue application, the need for a line quadrupler becomes increasingly apparent. When displaying conventional NTSC, PAL or SECAM video onto a large screen, the spaces between scan lines are obvious and make the picture look dark and diminished. The lack of brightness is caused by displaying a low resolution on the larger screen. With the horizontal scan rate increased by four, the System 4LQ*xi* fills in the gaps and the light output is therefore increased. The projector's light output capacity is now more fully utilized and thus, the overall picture is brighter.

Universal Control

The System 4LQ*xi* includes universal projector control that will operate with most digitally controlled projectors on the market today such as Ampro, Barco, Electrohome, Hughes/JVC, Mitsubishi, NEC, Panasonic, Runco, SELECO, Sony and Toshiba, as well as the Mitsubishi XC Series monitors. The System 4LQ*xi* has four universal inputs capable of accepting all computer RGB signals, composite video and S-Video (S-VHS) standard signals (NTSC, PAL or SECAM). Any video or 15.75 kHz RGB Signal will be quadrupled.

The universal projector control function allows bi-directional "talk & listen" communication with most large-screen CRT-based projectors. When connected, the System 4LQ*xi* will be recognized by the projector as the projector's own brand of switcher. The System 4LQ*xi* can turn the connected projector on or off, switch input memory blocks for convergence, and set-up saved configurations by input selection of the connected projector. It will then "talk" as well as "listen" to the projector for continuous update changes, feature changes or input selection changes made by the user.

All this makes the System 4LQ*xi* easy to learn, as it works almost identically to the projector-brand switcher. The advantage is one switcher for all projectors; there is no need to learn all the different types of set-up and control functions of each projector-brand switcher that is connected. And it works the same way with all brands– only the internal communications board dip switch settings are different. In fact, the System 4LQ*xi* may be controlled via the projector manufacturer's remote control.

Audio Switching & Processing

The System 4LQ*xi* is also compatible with balanced and unbalanced, two-channel stereo audio. The System 4LQ*xi* has the ability to switch between the four audio inputs. The audio can either follow any video or RGB input signal or be broken away from the video. With "breakaway" switching, the audio signal may be separated from the video signal to switch either the video only or the audio only. For example, in an application where the user wants to show the video only from input source "one" in conjunction with the audio from input source "two", the audio would be broken away from source one and source two would be switched to the final output. This provides increased flexibility for all types of professional A/V applications.

FEATURES

- Quad-standard decoder– The System 4LQ*xi* is compatible with all standard video formats including NTSC 3.58, NTSC 4.43, PAL and SECAM.
- Built-in line quadrupler– The System 4LQ*xi* includes a built-in line (scan) quadrupler which eliminates scan lines on video images by quadrupling the number of lines displayed. The input video (15.7 kHz) is converted to a 63 kHz RGB line quadrupled analog signal– especially useful for large screen displays.
- Three-line adaptive comb filter– A built-in three-line adaptive comb filter helps provide crisp, stable output from the System 4LQ*xi*.
- Motion mode compensation– The System 4LQ*xi* line quadrupler has motion mode compensation to eliminate the "jaggies" which are commonly associated with enhanced video such as and line quadrupling.
- Universal inputs– The System 4LQ*xi* has four universal inputs capable of accepting all computer RGB signals, composite video and S-Video standard signals (NTSC, PAL and SECAM). No optional modules are needed for each input signal type. Looping capabilities allow for up to 22 inputs.
- Balanced/unbalanced stereo audio inputs– Every System 4LQ*xi* is capable of switching up to four balanced or unbalanced stereo audio signals. Input through professional captive screw terminals, audio can be switched to follow any video or RGB input signal or "broken away" for maximum flexibility.
- Triple Action Switching™ (RGB delay switching)– Exclusive to Extron, this unique delay switching feature in the System 4LQ*xi* makes it possible to have "seamless" switching for all projector models. This is done by a triple-action switch. When an input is selected (either by front panel or RS-232), the RGB video is turned "off" and sync is left on, then sync is switched to the new source and finally, RGB video is turned back "on." This makes "glitch free" switching possible with every projector on the market.
- LCD menu-driven picture and programming controls– The System 4LQ*xi* has an LCD menu that makes set-up and programming of its many features or functions simple. An alpha-numeric display allows for any of the line quadrupler controls such as color, hue, contrast and detail to be adjusted and stored in memory for each input.
- Picture control memory– Each input has a separate memory block for all picture controls of video or RGB signals (including audio switching). These may be set and stored by the System 4LQ*xi*.

FEATURES (Cont.)

- Sync polarity programming– The output sync polarity of the System 4LQ*xi* may be programmed to be either positive or negative going for both horizontal and vertical sync signals, ensuring that any projector will differentiate the line quadrupler's output from that of a 1280 x 1024 SUN or SGI work station.
- Universal projector control– Extron's System 4LQ*xi* is fully compatible with all digitally controlled projectors. Using the projector-brand remote control, the System 4LQ*xi* can be made to switch inputs, power "on" or "off" the projector, mute the audio or video signals and switch the four inputs. This may also be accomplished by using the System 4LQ*xi* front panel controls or through a third party control system via RS-232, in order that the switcher is able to "talk" to the projector.
- Universal compatibility– The System 4LQ*xi* communicates using the projector manufacturer's remote control with all digitally controlled projectors on the market today such as Ampro, Barco, Electrohome, Hughes/JVC, Mitsubishi, NEC, Panasonic, Runco, SELECO, Sony and Toshiba as well as the Mitsubishi XC Series monitors.
- RS-232 control– The System 4LQ*xi* has built-in RS-232 control for third party control of any of its features or functions. Extron has also developed a free Windows® based control program which allows the 4LQ*xi* to be controlled by a remote PC.
- 300 MHz RGB video bandwidth– The 300 MHz (-3 dB) bandwidth of the System 4LQ*xi* allows for the connection of video signals and super high resolution computers such as SUN, Silicon Graphics, VESA, MAC/Quadra, SuperVGA, PowerMAC, Power PC, HP, NCD, Chromatics and DEC workstations. This ensures the highest resolution possible for any application.
- RGBS or RGBHV output– The System 4LQ*xi* converts all video inputs to an RGB output. This one output (RGBS or RGBHV) makes the System 4LQ*xi* easy to connect all video signals to any projector brand through one cable.
- 1U rack-mountable enclosure– The System 4LQ*xi* is housed in a metal 1U high, rack-mountable enclosure, with an internal auto-switchable 100-240 volt auto-switchable power supply. Enclosure includes rack "ears" and hardware.
- Triple-split screen mode– Extron's System 4LQ*xi* has a triple-split screen mode that displays TSC/PAL/SECAM, line doubled video and line quadrupled video simultaneously on the same display. This provides the opportunity of showing the advantages of image purity and brightness when using a line quadrupler.

SPECIFICATIONS

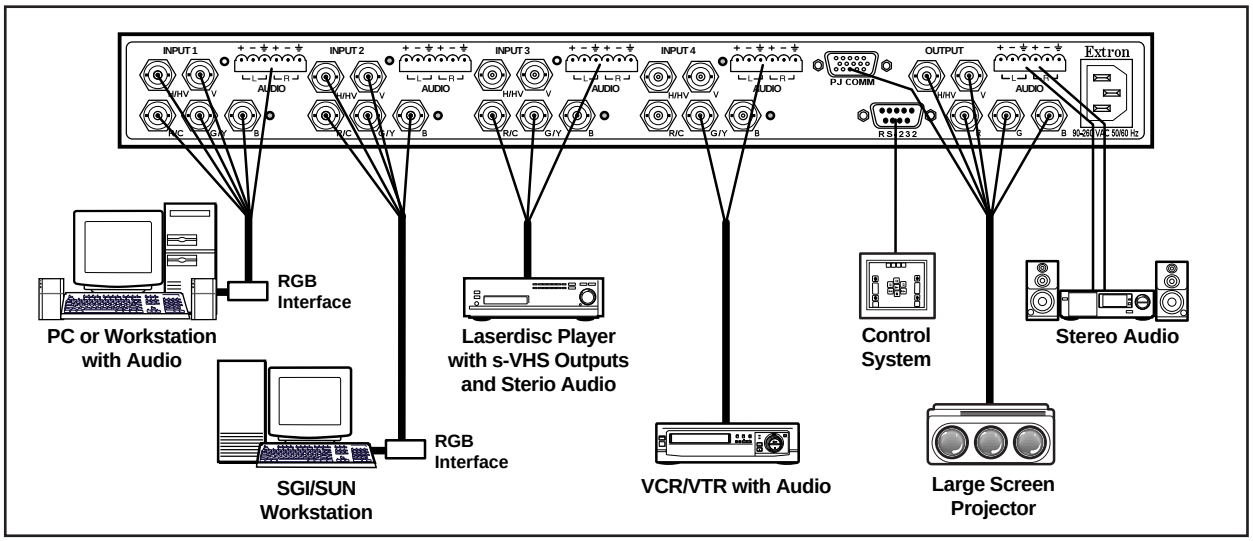
Inputs
- RGB Video
  - Bandwidth ..... 300 MHz (-3 dB)
  - Return loss at 10 MHz ..... 25 dB
  - Crosstalk at 10 MHz ..... -35 dB
  - Isolation at 10 MHz ..... -55 dB
- Audio
  - Frequency response ..... 20 Hz to 20 kHz
  - Signal to noise ratio ..... 85 dB minimum
  - Total harmonic distortion ..... -78 dB
  - Peak to peak voltage..... 8 volt p-p
- Audio input
  - Type..... 4 inputs, two channel, balanced
  - Connectors ..... Captive screw connector, 6 conductor
  - Impedance ..... >10 k ohm, AC coupled
  - Maximum level (balanced or unbalanced)..... 11.2 dBu
  - CMRR..... >60 dB typical
- Audio throughput
  - Routing ..... 1 of 4 two channel routing
  - Response ..... ±.05 dB 20 Hz to 20 kHz
  - Gain adjustment ..... -95.5 dB to +31.5 dB, both left and right channels per input
  - THD + Noise ..... 0.002% worst case, +10 dBu input, +10 dBu output, balanced input and output
  - S/N ..... >95 dBu, 0 dBu reference
  - Adjacent input crosstalk..... Better than 85 dB from 20 Hz to 20 kHz
  - Stereo channel separation..... 60 dB from 20 Hz to 20 kHz

SPECIFICATIONS (Cont.)

Outputs
- RGB and sync
  - Frequency ..... 63 kHz horizontal, 60 Hz vertical
  - Resolution ..... 1280 x 1024
  - Connectors ..... Female BNC's
  - Impedance ..... 75 ohms video, 510 sync
- Audio output
  - Type..... 1 output, two channel balanced
  - Connectors ..... Captive screw connector, 6 conductor
  - Impedance ..... 50 ohms capable of driving 600 ohms
- Audio gain
  - Output taken single ended..... 0 dB± channel throughput gain
  - Output taken differentially ..... ±6 dB channel throughput gain
  - Gain error ..... ±0.2 dB channel to channel
  - Muting..... >95 dB
  - Drive ..... +11.2 dBu into 600 ohms

Switching speed..... 5 mS (max)
Power supply ..... 100 - 240 VAC 50/60 Hz (auto-switchable)
Power consumption..... 30 watts
Operating temperature ..... 0˚ - 50˚ C
Storage temperature..... -20˚ to +70˚ C
MTBF (demonstrated) ..... 30,000 hours
Approved..... UL & CE Listed
Dimensions ..... 1.74"H x 19"W x 16.2"D
4.4 H x 48 W x 41 D cm
Shipping weight ..... 21 lbs. (9.5 kg)
Warranty ..... Two years, parts & labor
Part number 60-221-01

APPLICATION DIAGRAM



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